

US EPA ARCHIVE DOCUMENT



BioSurface Technologies Corporation

CDC Biofilm Reactor

The CDC Biofilm Reactor consists of eight (8) polypropylene coupon holders suspended from a UHMW-polyethylene ported lid. The coupon holders can accommodate three 1/2 inch (12.7 mm) diameter coupons each. The lid with coupon holders and coupons is mounted in a 1 liter glass vessel with side-arm discharge port. A liquid growth media/biocide/etc. is circulated through the vessel while mixing and shear is generated by a magnetic stir bar/vane rotated by a magnetic stir plate.

Sampling of the coupons is conducted by aseptically removing individual coupon holders with accompanying coupons (3). The coupon holder or a blank is replaced in the lid after sampling to allow the time course experiment to continue.

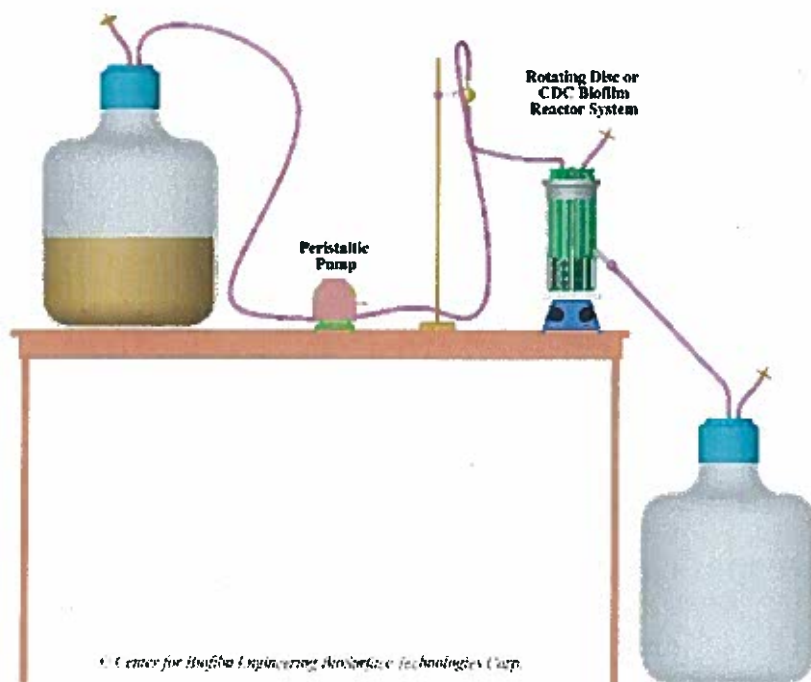
The coupon removed from the reactor vessel is then used for treatment evaluations, scraped to collect the biofilm sample for further study, or imaging using microscopy and image analysis.

The CDC Biofilm Reactor is autoclavable and re-useable. The total liquid volume is approximately 350 ml. A variety of coupon materials are available, including plastics, metals, and ceramics.



CBR 90 CDC Biofilm Reactor

(CDC Biofilm Reactor Licensed from
the Centers for Disease Control)



Reactor Set-Up

(pumps, tubing, and reservoirs not included)

421 Griffin Drive #2
Bozeman, MT 59715

Phone: 406-585-2812

FAX: 406-587-7008



BioSurface Technologies Corporation

CDC Biofilm Reactor

Biofilm Reactor Description

Pricing (USD)*

Model CBR 90-2 CDC Biofilm Reactor w/o stir plate

\$860.00

includes: 24 polycarbonate coupons (alternate materials available upon request, pricing may vary), glass side-arm discharge vessel, stir bar/vane, coupon holder rods (8), flow breaks (2), bacterial vent filter, ported lid, and coupon removal tool.

Model CBR 90 -1 CDC Biofilm Reactor System with Standard Stir Plate (115 VAC)

\$1,260.00

Standard Magnetic Stir Plate (110-120 VAC) and reactor supports.

includes: 24 polycarbonate coupons (alternate materials available upon request, pricing may vary), glass side-arm discharge vessel, stir bar/vane, coupon holder rods (8), flow breaks (2), bacterial vent filter, ported lid, and coupon removal tool.

Model CBR 90 -1-Int CDC Biofilm Reactor System with Stir Plate (230 VAC/CE)

\$1,340.00

Standard Magnetic Stir Plate (220-240 VAC, CE Certified) and reactor supports.

includes: 24 polycarbonate coupons (alternate materials available upon request, pricing may vary), glass side-arm discharge vessel, stir bar/vane, coupon holder rods (8), flow breaks (2), bacterial vent filter, ported lid, and coupon removal tool.

Model CBR 90 -1DH CDC Biofilm Reactor System with Digital Stir/Hot Plate

\$2,040.00

Digital Stir/Hot Plate with Temperature Control (110-120 VAC) and reactor supports.

includes: 24 polycarbonate coupons (alternate materials available upon request, pricing may vary), glass side-arm discharge vessel, stir bar/vane, coupon holder rods (8), flow breaks (2), bacterial vent filter, ported lid, and coupon removal tool.

Model CBR 90 -1DH-Int. CDC Biofilm Reactor System with Digital Stir/Hot Plate

\$2,200.00

Digital Stir/Hot Plate with Temperature Control (220-240 VAC/ CE certified) and reactor supports

includes: 24 polycarbonate coupons (alternate materials available upon request, pricing may vary), glass side-arm discharge vessel, stir bar/vane, coupon holder rods (8), flow breaks (2), bacterial vent filter, ported lid, and coupon removal tool.

Model CBR 90-3 Anaerobic/Sealed CDC Biofilm Reactor w/o stir plate

\$1,240.00

includes lid with silicone gasket seals for coupon holder rods and lid seal to glass vessel, 24 polycarbonate coupons (alternate materials available upon request, pricing may vary), glass side-arm discharge vessel, stir bar/vane, coupon holder rods (8), flow breaks (2), bacterial vent filter, ported lid, and coupon removal tool.

CDC Components

CBR-2203 CDC Biofilm Reactor Coupon Holder

\$36.50

Polypropylene coupon holder (holds 3 coupons each)

CBR-2203-MBM CDC Biofilm Reactor Membrane Holder

\$68.00

Polypropylene rod with stainless steel frame to hold membrane samples

CBR -2203-GL CDC Biofilm Reactor Slide Holder

\$35.00

Polypropylene rod to hold 0.70 inch (18 mm) or less wide x 0.063 inch(1.6 mm) thick slide coupons

CBR-2203B CDC Biofilm Reactor Holder Blank (no coupon recesses)

\$31.00

Polypropylene coupon holder (holds 3 coupons each)

RD 140 Side-arm flask 1-liter glass beaker with side-arm port at 400 ml (nominal)

\$94.00

CBR 2201/2202 Stir Bar/Vane Assembly

\$75.00

CBR 2204 Ported Lid Assembly includes: glass rod shaft and ported lid

\$205.00

*Pricing shown is for domestic US Market. Please Contact BioSurface Technologies Corporation, or one of our international distributors for international pricing. International customers will incur additional charges associated with shipping, insurance, import duties, taxes, and fees that are not covered by BioSurface Technologies Corporation.

[Many coupon materials available including plastics, metals, and ceramics. Contact BioSurface Technologies for a complete listing.]



BioSurface Technologies Corporation

(www.biofilms.biz)

Disc Coupon Materials for the CDC and RDR Reactors

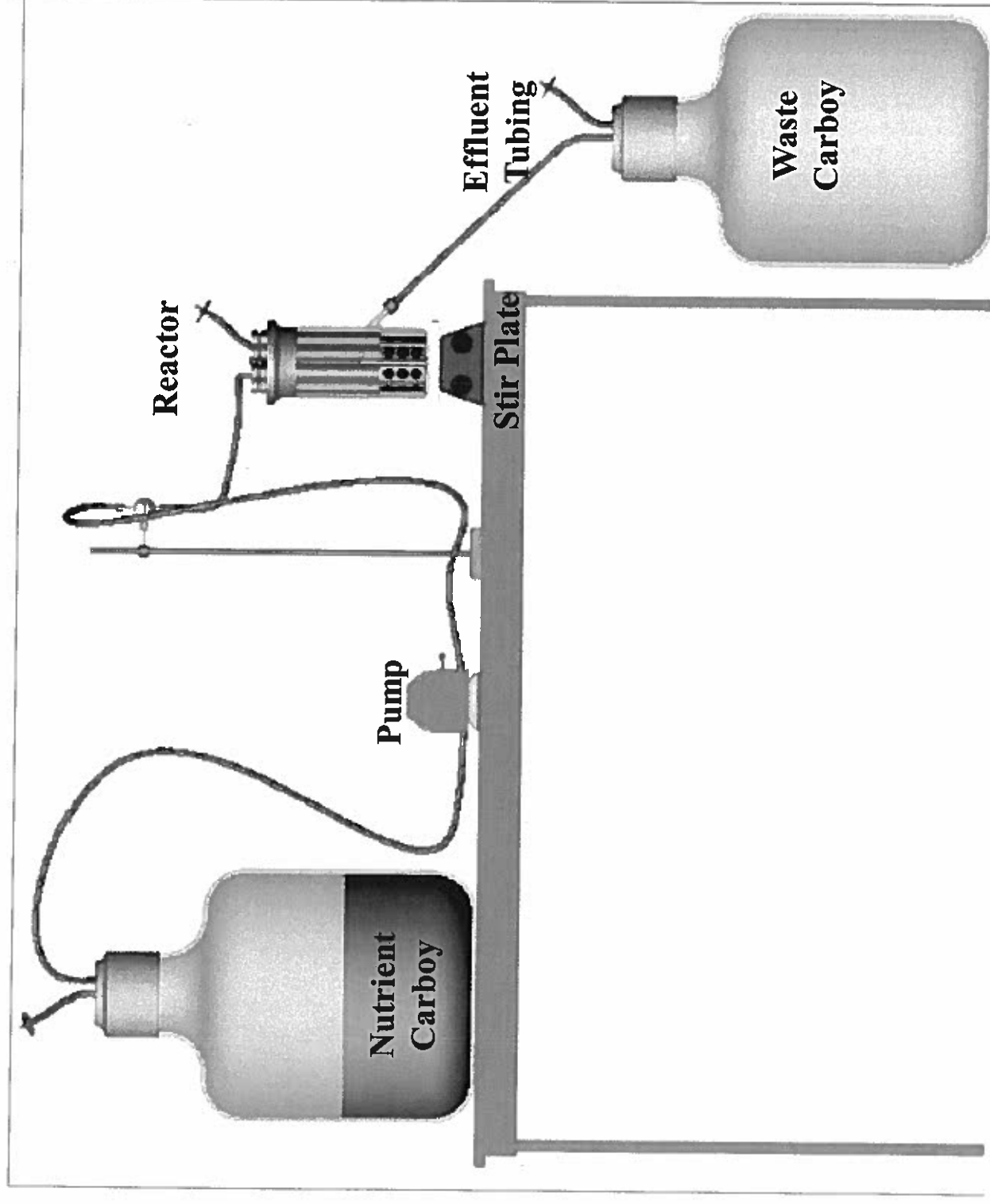
Part Number	Description	Price per coupon (USD)*
RD 128-PC	Polycarbonate Coupon	\$4.50
RD 128-316	Stainless Steel (316L) Coupon	\$6.10
RD128-316P	Stainless Steel (316L) Coupon-Polished Surface	\$12.50
RD 128-HA	Hydroxy Apatite Coupon	\$8.40
RD 128-GL	Borosilicate Glass Coupon	\$12.50
RD 128-PTFE	Teflon coupons	\$7.80
RD 128-PL	Porcelain surface coupon	\$26.20
	(porous ceramic substratum, one side glazed porcelain)	
RD 128-GT	Glazed Tile coupon	\$16.80
	(porous ceramic substratum, one side glazed tile surface-white)	
RD128-CS	Carbon Steel	\$6.10
RD 128-PS	Polystyrene coupon (non-autoclavable)	\$5.10
RD 128-PVC	PVC (white) Coupon (non-autoclavable)	\$5.10
RD128-PP	Polypropylene Coupon	\$5.10
RD128-304	Stainless Steel (304) Coupon	\$6.10
RD128-CI	Cast Iron Coupon	\$6.20
RD128-DI	Ductile Iron Coupon	\$8.00
RD128-BUNA AHW	White High Grade FC Buna N Rubber Coupon	\$4.40
RD128-PE	UMHW Polyethylene Coupon	\$5.10
RD128-Ti	Titanium Coupon	\$9.00
RD128-Ni	Nickel Coupon	\$8.50
RD128-347	Stainless Steel (347) Coupon	\$6.60
RD128-AL	Aluminum Coupon	\$5.90
RD128-PG	Plexiglass (acrylic) Coupon (non-autoclavable)	\$5.10
RD128-PETG	Polyethylene Terephthalate Glycol (PETG) Coupon (non-autoclavable)	\$5.10
RD128-PU	Polyurethane Coupon (high temperature polymer)	\$5.40
RD128-Vi	Viton Coupon	\$7.40
RD128-Cu	Copper Coupon	\$6.90
RD128-CPVC	CPVC Coupon	\$5.30
RD128-Si	Silicone Rubber Disc Coupon	\$4.60
RD128-PEEK	Polyetheretherketone (PEEK :Arlon 1330) Coupon	\$5.30
RD128-PET	Polyethylene Terephthalate (PET: Polyester, Dacron) Coupon	\$5.10
RD128-Ny	Nylon Disc Coupon	\$5.10
RD128-ABS	Acrylonitrile Butadiene Styrene (ABS) Coupon (non-autoclavable)	\$5.10
RD128-CC	Concrete Coated Polycarbonate (polycarbonate cup filled with concrete)	\$8.00
RD128-NR	Natural Rubber Disc Coupon	\$5.00
RD128-EPDM	EPDM Rubber Disc Coupon	\$5.00
RD128-HY	Hypalon Rubber Disc Coupon	\$5.00
RD128-PCC	Polycarbonate Cup Coupon	\$6.20
CBR 5497	Coupon Removal Tool-Hex Drive	\$6.00
CBR 2210	Coupon Manipulation Tool-Stainless Steel Coupon Tweezer	\$50.00

ALL PRICING BASED ON PAYMENT TERMS OF NET 30 DAYS.

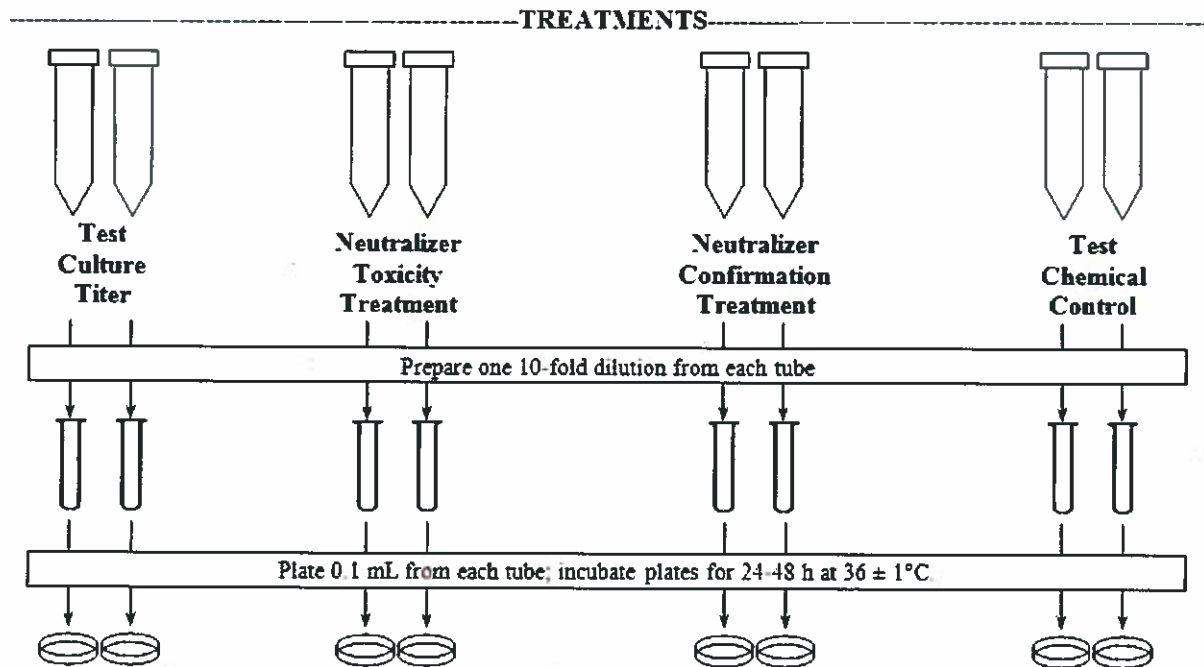
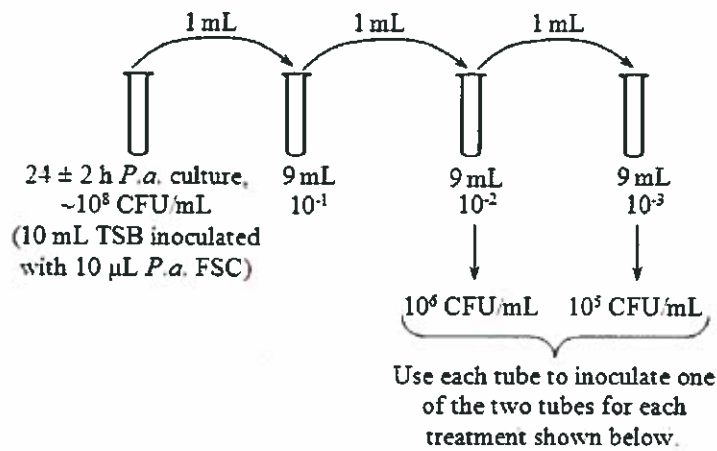
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Schematic of completely assembled reactor system

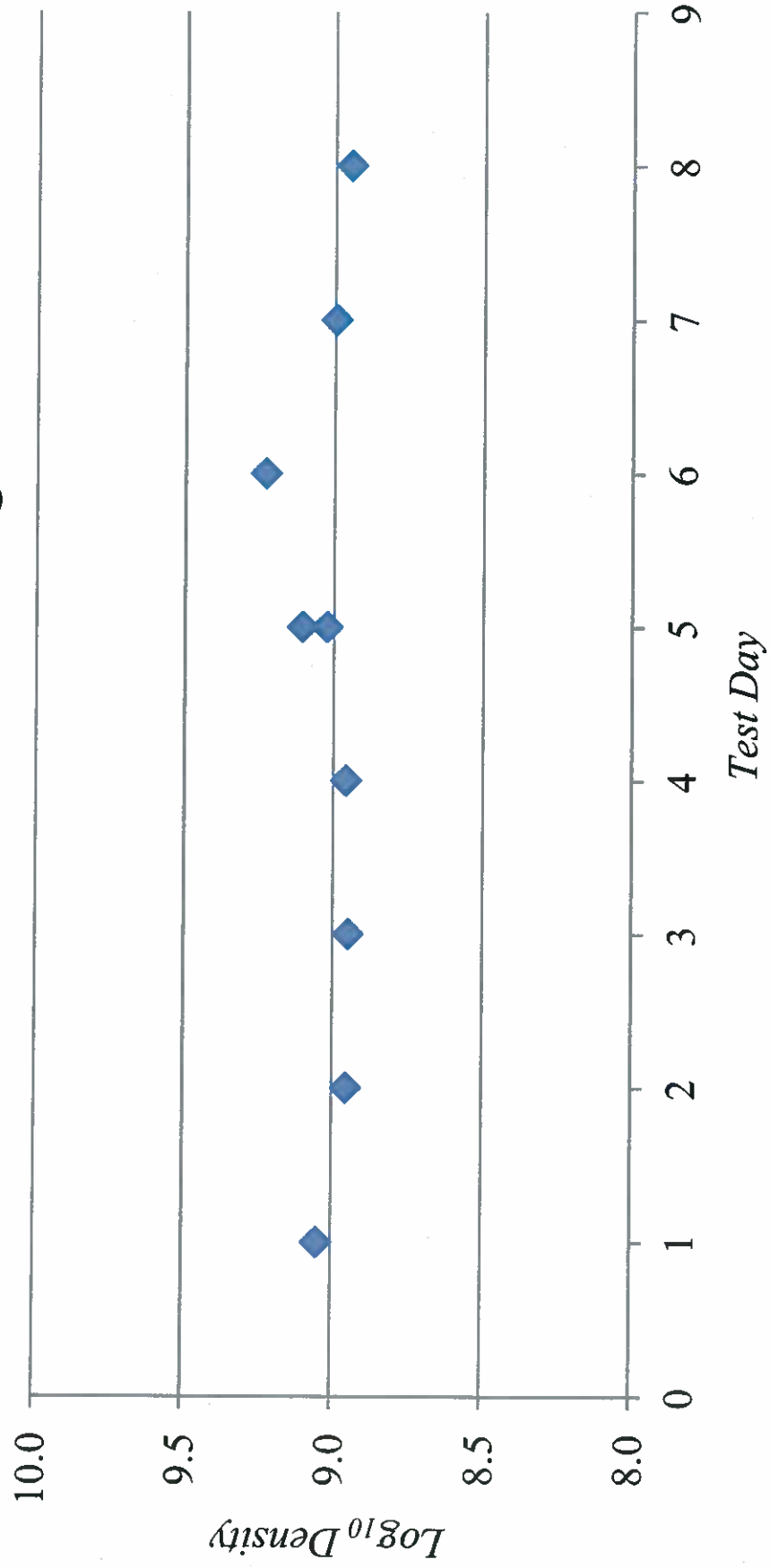
(copied from ASTM E2562-12)



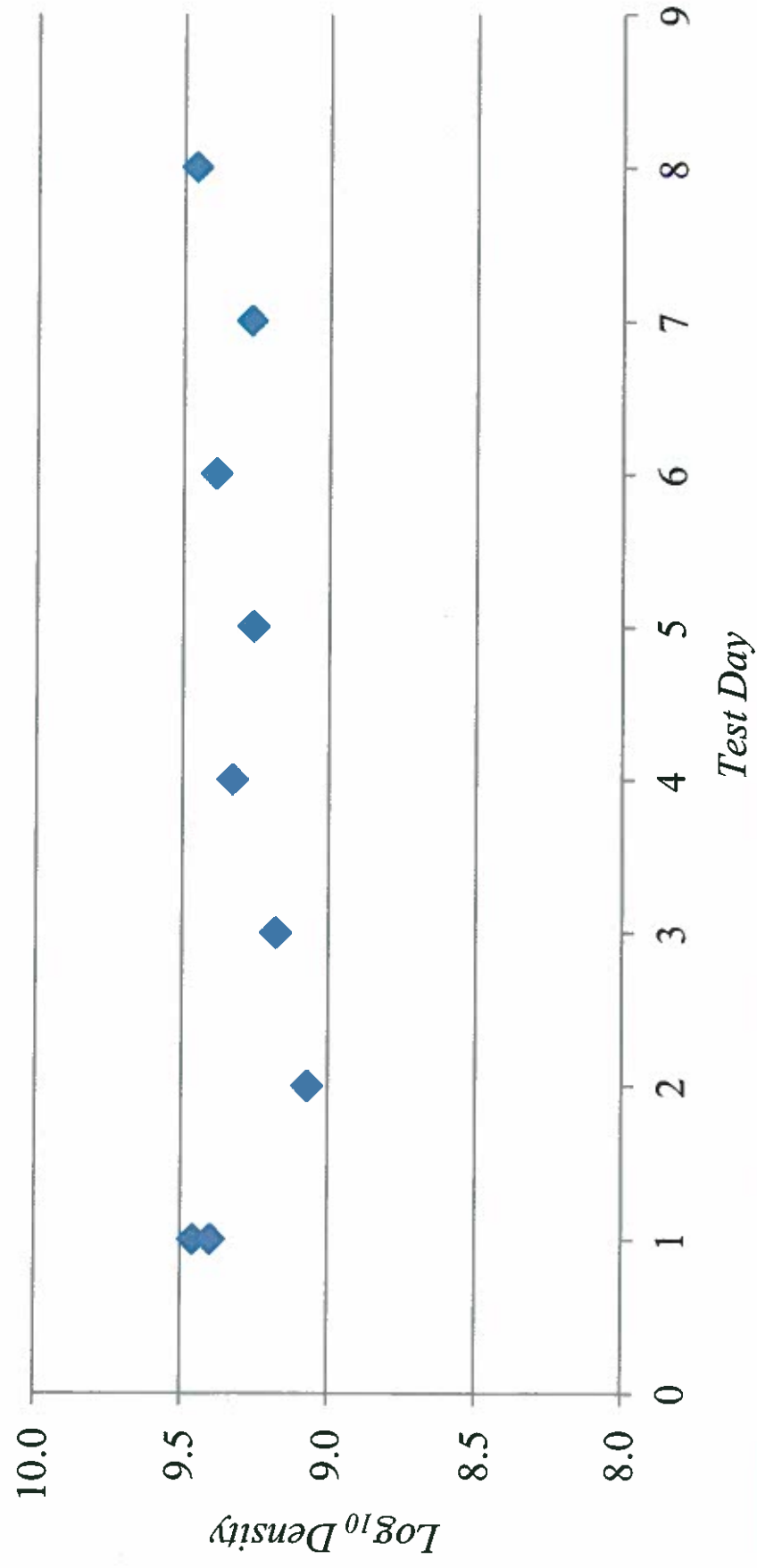
Biofilm Neutralization Assay Flow Chart



Control Counts for *P. aeruginosa*



Control Counts for *S. aureus*



Corning® 250mL PP Centrifuge Tubes with Plug Seal Cap, Sterile, 6/Pack, 102/Case (Product #430776)



Corning® 250mL polypropylene (PP) centrifuge tubes are ideal for applications requiring large volume centrifugation. Please check our Technical Information Listing for information on the physical and chemical properties of Corning plastic centrifuge tubes as well as important suggestions for safe use.

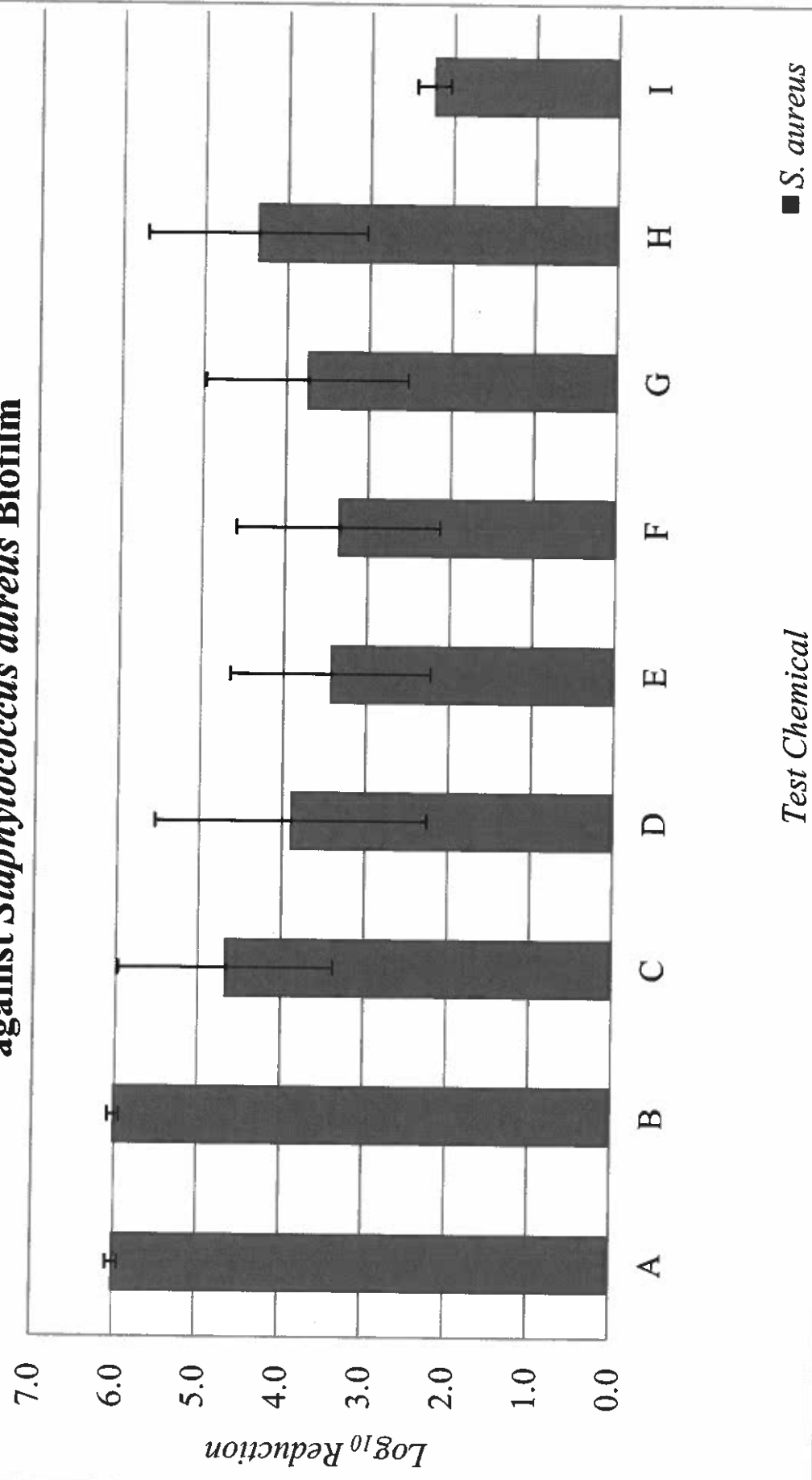
- Support cushions (Catalog No. 430236 for 250) must be used with this product unless the centrifuge rotor has appropriate V-bottom cushions.
- Polyethylene plug seal caps.
- Maximum RCF of 6,000xg
- Tubes are sterile and certified nonpyrogenic.

Case List Price: \$239.23

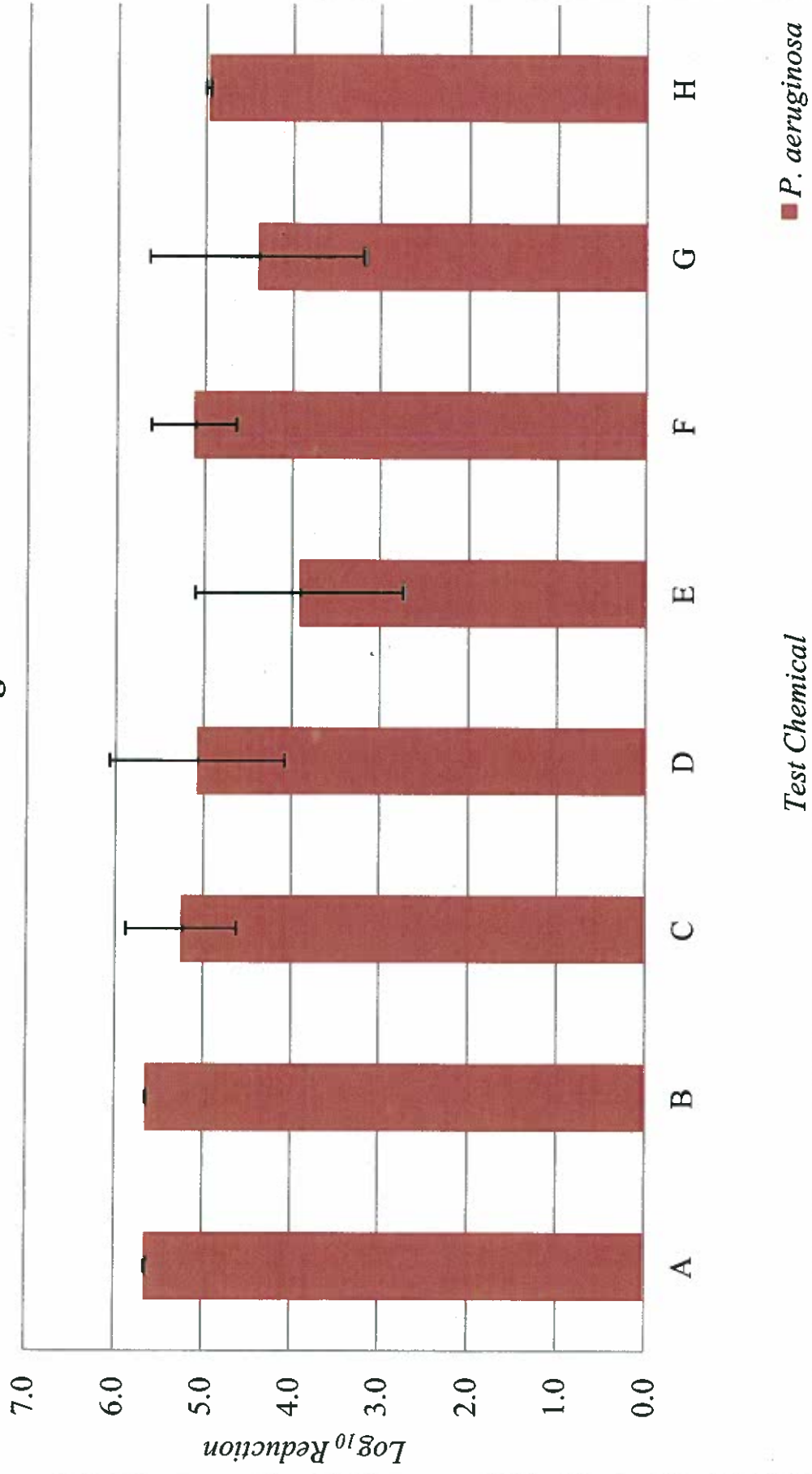
product details at-a-glance

Qty./Pk.:	6
Qty./CS.:	102
Capacity:	250 mL
Tube Style:	Centrifuge
Bottom Style:	Conical
Neck Style:	Short
Top Style:	Threaded
Max RCF:	6000 xg
Graduations:	Yes
Graduation Range:	1.5-14.5 mL
Graduation Interval:	0.5 mL
Color:	Natural
Cap Style:	Plug Seal
Cap Material:	High Density Polyethylene
Cap Color:	Orange
Sterile:	Yes
Self Standing:	No
Feature:	Disposable
Rack:	No

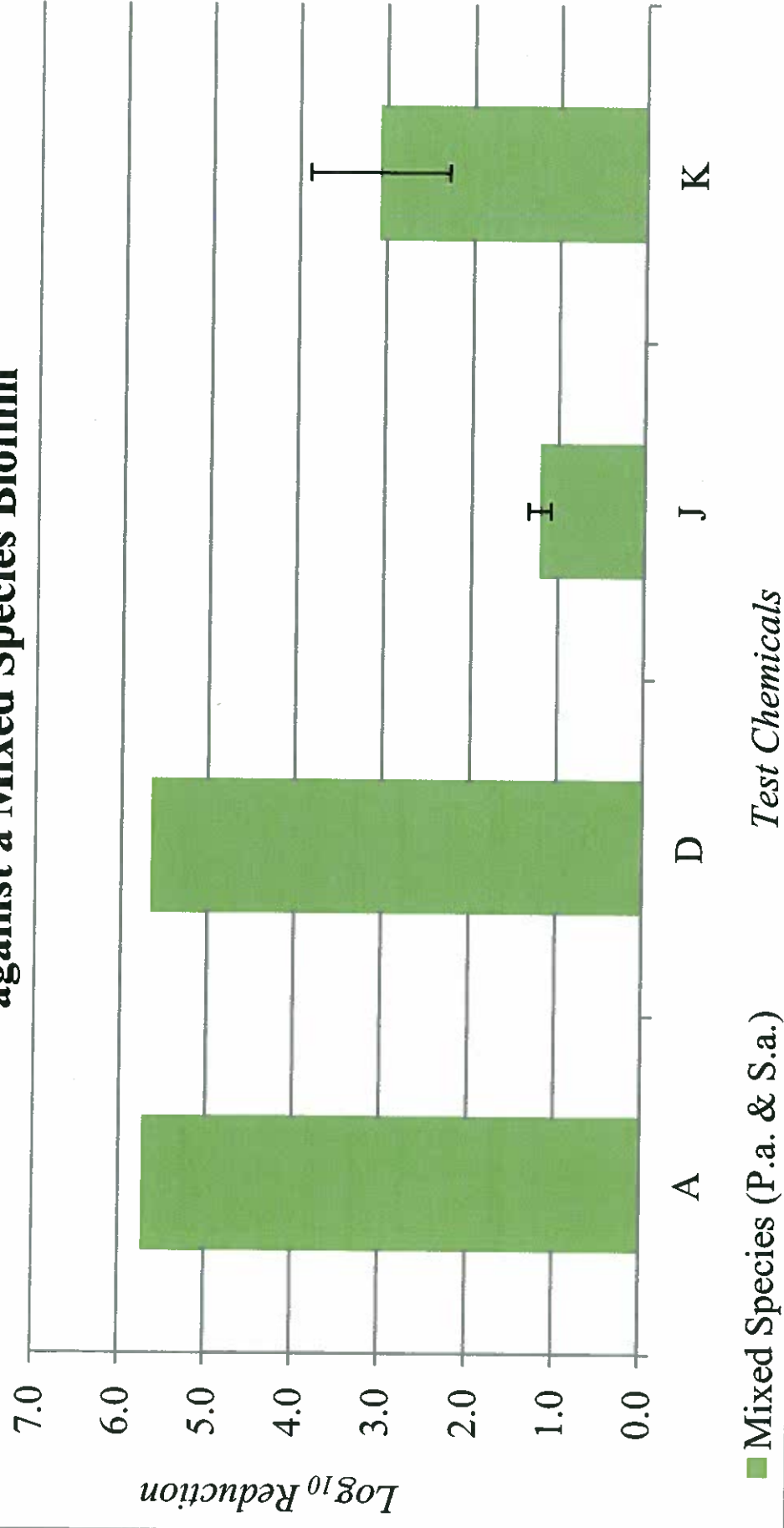
Test Chemicals Evaluated using the Single Tube Method against *Staphylococcus aureus* Biofilm



**Test Chemicals Evaluated using the Single Tube Method against
Pseudomonas aeruginosa Biofilm**



Test Chemicals Evaluated using the Single Tube Method against a Mixed Species Biofilm



Sample Calculation

If no recovery from the 10^{-1} dilution tube, substitute 0.5 as the CFU/plate recovered.

$$\left(\frac{0.5}{10^{-1}}\right) \times 10 \times 40 = 2,000 \text{ CFU/carrier}$$

- 0.5 is the CFU/plate recovered
- 10^{-1} is the dilution from which the aliquot was plated
- 10 accounts for the volume plated (0.1 mL)
- 40 accounts for the volume originally in the tube with the carrier (4 mL disinfectant + 36 mL neutralizer)



Pall Corporation

Contact Us: www.pall.com/contact

47 mm Magnetic Filter Funnels

Description

Unique Magnetic Seal Allows Easy, One-Handed Vacuum Filtration of Liquids

- ▶ No-leak magnetic seal allows one-hand operation.
- ▶ Polyphenylsulfone construction is compatible with anti-foaming agents and many other solvents.
- ▶ Convenient. 150 mL size allows for easy fit into small autoclaves and 500 mL size is ideal for filtration of large samples.
- ▶ Sturdy and safe. Polyphenylsulfone construction provides durability and added safety at a cost less than most glass funnels.
- ▶ Forceps access point allows easy filter retrieval.
- ▶ Graduated at 50 mL increments for accurate sample measurement.
- ▶ [New 47 mm Sentino™ Magnetic Filter Funnels also available.](#)



Application

- ▶ Use for the Membrane Filter (MF) Technique
- ▶ Municipal water treatment testing
- ▶ Surface water analysis
- ▶ Plant process water testing
- ▶ Drinking water analysis

Specifications

Materials of Construction

- ▶ Funnel Body, Stem, Lid, and Support Screen: Polyphenylsulfone
- ▶ Vent Plugs: Polypropylene

Effective Filtration Area

- ▶ 150 and 300 mL: 9.6 cm², 35 mm effective diameter
- ▶ 500 mL: 13.1 cm², 41 mm effective diameter

Dimensions

- ▶ Overall Height:
 - 150 mL: 17.8 cm (7.0 in.)
 - 300 mL: 22.9 cm (9 in.)
 - 500 mL: 19.6 cm (7.7 in.)
- ▶ Maximum Diameter:
 - 150 and 300 mL: 7.6 cm (3 in.)
 - 500 mL: 8.9 cm (3.5 in.)

Filter Size

- ▶ Accepts 47 mm filter

Funnel Capacity

- ▶ 150, 300, or 500 mL

Outlet Connection

- ▶ Stem fits into standard one-hole stopper.

Sterilization

- Provided non-sterile. Withstands multiple autoclavings* at 121 - 123 °C (250 -253 °F) at 1.0 bar (100 kPa, 15 psi) for 15 - 20 min; UV sterilizable.

**Repeated use of detergents containing polyoxyethylated alkyl phenols and alcohols, and/or anti-corrosion, anti-scaling boiler additives that may carry over in steam, may cause polyphenyl sulfone to crack, thereby reducing the life of the product. Do not autoclave rubber stoppers. Do not autoclave with aluminum foil; use autoclave paper. Consult Pall Technical Service if using with thin membranes, such as track-etched material.*

Related Products

- [Ampoule Media for Microbiological Analysis](#)
- [Filter Funnel Manifolds](#)
- [Stainless Steel Forceps](#)
- [Vacuum/Pressure Pumps](#)

Ordering Information

Part Number	Description	Pkg	Price	Qty
47 mm Magnetic Filter Funnels				
4247	47 mm, 150 mL capacity	1/pkg	NA	<input type="text" value="0"/>
4242	47 mm, 300 mL capacity	1/pkg	NA	<input type="text" value="0"/>
4241	47 mm, 300 mL capacity, with lid	1/pkg	NA	<input type="text" value="0"/>
4238	47 mm, 500 mL capacity	1/pkg	NA	<input type="text" value="0"/>
Accessories and Replacement Parts				
4235	Stainless steel support screen	1/pkg	NA	<input type="text" value="0"/>
87264	Support screen, polyphenylsulfone	1/pkg	NA	<input type="text" value="0"/>
4244	Base, without support screen	1/pkg	NA	<input type="text" value="0"/>
4246	Lid kit (for 300 mL funnel only)	1/pkg	NA	<input type="text" value="0"/>
4248	150 mL funnel housing	1/pkg	NA	<input type="text" value="0"/>
4243	300 mL funnel housing	1/pkg	NA	<input type="text" value="0"/>
4254	500 mL funnel housing	1/pkg	NA	<input type="text" value="0"/>
82728	No. 8 rubber stopper	1/pkg	NA	<input type="text" value="0"/>

Contact Information

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